Deliverables

Phase 1 (1 Week)

A. GIS Based Based Data Collection Tool used to collect the following data:

1. Farmer Data

This data captures the individual and farm-level information of farmers to help identify their contributions and needs. The data would help:

a. Identify registered farmers and their productivity levels.
b. Enable targeted interventions (e.g., input financing, subsidies)

Farmer Details

1. Personal Information

Full Name (First, Middle, Last).

Gender (Male/Female)

Date of Birth (to analyze demographics).

Phone Number (primary and alternate).

2. **Geographic Location**

Residential Address.

Community, Local Government Area (LGA), City, State.

3. **Farmer KYC (Know Your Customer)**

Verification Details

Farmer's Photograph.

ID Type (e.g., National ID, Voter's Card, Driver's License, International Passport).

ID Number.

Image of the ID Document (scanned/uploaded).

4. **Farm Data**

Farm Location: GPS Coordinates (must be unique to avoid duplicate or fake farms).

Farm Boundary Data (mapped boundary to calculate the size).

Farm Ownership: (Owned, Leased: If leased, duration of lease)

5. **Farmer Type**

Categories: (Crop Farmer/Livestock Farmer/Both (if applicable).

6. **Farmer Affiliations to Cooperatives**

Cooperative Membership:

Are you a member of a cooperative? (Yes/No).

Name of the Cooperative.

Activities of the Cooperative (e.g., group farming, bulk purchasing of inputs).

The Data can then be used to understand the following within the platform:

a. Total arable land area owned or leased.
b. Segmentation of land by crop types or livestock facilities.
c. Crops Grown and Livestock Raised
d. Type of crops planted and acreage per crop.
e. Type of livestock raised and the number of animals (e.g., poultry, goats, cattle).

Phase 2 (2 Weeks)

B. **Platform for Visualization and Mapping**

- Dynamic GIS-powered digital map visualizing:
  - Land use, water bodies, and forest reserves.
  - Farmer data by region.
  - Commodity distribution by state/community.

C. Develop APIs for External Visualizations

1. Farmer Data APIs

1. Farmer Registration API:

- Functionality: Enables farmers to register and update their details.
- Endpoints:
  - `POST /farmers/register` (Add farmer data).
  - `PUT /farmers/{farmer_id}` (Update farmer details).
  - `GET /farmers/{farmer_id}` (Retrieve specific farmer details).

2. Farm Boundary Mapping API:

- Functionality: Enables uploading of farm GPS coordinates and boundary data.
- Endpoints:
  - `POST /farms/{farmer_id}/boundary` (Upload GPS coordinates and boundaries).
  - `GET /farms/{farm_id}/size` (Retrieve calculated farm size).

3. Farmer Cooperative API

- Functionality: Manage farmer affiliations with cooperatives.
- Endpoints:
  - `POST /farmers/{farmer_id}/cooperative` (Add farmer cooperative membership).
  - `GET /cooperatives/{cooperative_id}` (Retrieve cooperative details).

2. Land Use Data APIs

1. Land Mapping API:

    - Functionality: Upload and retrieve land utilization data.
    - Endpoints:
        - `POST /lands/upload` (Upload land use data).
        - `GET /lands/{region}` (Retrieve land use data by state, LGA, or community).

2. Water Body API:

    - Functionality: Upload and access data on water bodies (e.g., dams, rivers).
    - Endpoints:
        - `POST /waterbodies/upload` (Upload water body data).
        - `GET /waterbodies/{id}` (Retrieve water body details).

3. Forest Data API:

    - Functionality: Retrieve data on forest reserves and conservation zones.
    - Endpoints:
        - `GET /forests/{region}` (Retrieve forest data by region).
        - `POST /forests/upload` (Upload forest reserve data).

3. Commodity Data APIs

D. Commodity Distribution API:

a. Functionality: Map commodities grown by community and state.
b. Endpoints:
    i. `POST /commodities/upload` (Upload commodity data).
    ii. `GET /commodities/{commodity_name}` (Retrieve commodity distribution).

Phase 3 (2 Weeks)

E. Development of APIs from Kitovu's YieldMaX platform and Integration of the API on the Platform

The personalized agronomic advisory and crop health management system for smallholder farmers would layer existing farms and farmers and data on fertilizer recommendations, water stress analysis, and crop health APIs developed by Kitovu Technology. The integrated APIs would develop personalized prescriptions for each farmer and match them to the right inputs. It would have:

- Real-time fertilizer recommendations.
- Crop health monitoring and water stress analysis.
- Integration with Kitovu APIs for tailored prescriptions.
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5. Advisory APIs

1. Agronomic Advisory API:
    - Functionality: Provide personalized advisory services.
    - Endpoints:
        - `GET /advisory/fertilizer/{farm_id}` (Get fertilizer recommendations).
        - `GET /advisory/crophealth/{farm_id}` (Retrieve crop health audit).
2. Weather and Water Stress API:
    - Functionality: Provide meteorological and water stress analysis.
    - Endpoints:
        - `GET /weather/{region}` (Retrieve weather data for a region).
        - `GET /waterstress/{farm_id}` (Retrieve water stress levels for a farm).

1. No two lands can be entered on the platform so incorporate geofencing
2. Tracking of Enumerators' live location as they capture data.